NASA/KSC GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2009
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SECTION 02 82 13.00 98

ASBESTOS ABATEMENT
10/07

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NOTE: This specification covers the requirements for the asbestos demolition, construction and abatement requirements at Kennedy Space Center (this includes NASA/KSC facilities at Cape Canaveral Air Station). This section is to be edited only by personnel certified by the State of Florida as a Florida Licensed Abatement Consultant (FLAC). This is designed as a local for NASA at Kennedy Space Center.

Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

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PART 1 GENERAL

1.1 SUMMARY

This section specifies the asbestos abatement requirements and the Contractor's applicable asbestos procedures, which include demolition or salvage of structures where asbestos is present, removal or encapsulation of materials containing asbestos, construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain asbestos, installation of products containing asbestos, asbestos spill/ emergency cleanup, transportation, disposal, storage, containment of and housekeeping activities involving asbestos or products containing asbestos, on the site or location at which construction activities are performed.

Asbestos Abatement work is categorized into four classes:

Class I Work: Activities involving the removal of Thermal System Insulation (TSI) and surfacing of Asbestos Containing Materials (ACM) and Presumed Asbestos Containing Material (PACM).

Class II Work: Activities involving the removal of ACM that is not TSI or surfacing material. This includes wallboard, floor tile, roofing, sidings, mastics and other materials.

Class III Work: Repair and Maintenance operations where ACM, including TSI and surfacing material is likely to be disturbed. Class III work cannot exceed more than one glovebag of material.

Class IV Work: Maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste, and debris from Class I,II, and III activities.

Conduct abatement work in accordance with the Class I, II, III, or IV Methods of Compliance as required by 29 CFR 1926, 40 CFR 61-SUBPART M, 49 CFR 171, 49 CFR 172, FAC CHAPTER 62-257, and FL-STAT 469.

1.2 DEFINITIONS

FLAC - Florida Licensed Asbestos Consultant as defined within the FL-STAT 469 ASBESTOS ABATEMENT.

IH - Kennedy Space Center Industrial Hygienist. This person can be either a government civil servant or an authorized government contractor. This person is responsible for the oversight and approval of the abatement procedures and the health, safety and welfare of those it effects.

1.3 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

COMPRESSED GAS ASSOCIATION (CGA)

CGA G-7.1	(2004) Commodity Specification for Air

FLORIDA ADMINISTRATIVE CODE (FAC)

FAC CHAPTER 62-257	(1999) Florida Administrative Code, Asbestos Program

FLORIDA STATUTES (FL-STAT)

FL-STAT 469	(2005) Asbestos Abatement

JOHN F. KENNEDY SPACE CENTER (KSC)

KNPR 1840.19	KSC Industrial Hygiene Programs

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 94-113	(1994; 4th Ed) NIOSH Manual of Analytical Methods

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.1101	Asbestos
40 CFR 61-SUBPART M	National Emission Standard for Asbestos
40 CFR 763	Asbestos
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

1.4 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in

context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Submit Work Schedule[; G][; G, [_____]] in accordance with the paragraph entitled, "Worker Protection," of this section.

Notification of Demolition/Renovation[; G][; G, [_____]]

SD-02 Shop Drawings

Submit items in accordance with the paragraph entitled, "Implementation Plan," of this section.

Coordination Drawings[; G][; G, [_____]]
Detailed Drawings[; G][; G, [_____]]

SD-06 Test Reports

Submit the following:

Initial Exposure Assessments[; G][; G, [_____]] in accordance with 29 CFR 1926

Notification of Demolition/Renovation[; G][; G, [_____]] as part of the Implementation Plan.

Submit Air Monitoring Reports[; G][; G, [_____]] in accordance with paragraph entitled, "Air Monitoring Report" of this section.

Maintain Work Site entry logs[; G][; G, [_____]] of all personnel entering and leaving the regulated work area by the on-site competent person indicating the date and time of entry and egress.

Maintain Daily Site Inspection Logs[; G][; G, [_____]] by the on-site competent person indicating the date, time and results of the work area daily site inspections.

Maintain Waste Drum Inventory[; G][; G, [_____]] of all generated waste drums or containers indicating the location and approximate quantity of material in each container.

SD-07 Certificates

Submit the following certificates:

Asbestos Consultant's License from the State of Florida, Department of Business and Professional Regulation (DBPR)

Asbestos Contractor's License[; G][; G, [_____]] or other Contractor license approval from the State of Florida, Department of Business and Professional Regulation (DBPR).

Training Certification[; G][; G, [_____]], and experience of Contractor's "Competent Person", supervisor, and workers.

Proficiency Analytical Test Certification

SD-08 Manufacturer's Instructions

Submit Material Safety Data Sheets[; G][; G, [_____]] in accordance with the paragraph entitled, "Licenses Permits, and Notices," of this section.

Submit Implementation Plan[; G][; G, [_____]] as identified in paragraph entitled, "Implementation Plan" prior to initial site set-ups or start of work.

SD-11 Closeout Submittals

Within 10 days after the completion of work, submit to the Contracting Officer a written summary and copies of the following items:

Notification of Demolition/Renovation.

Waste Disposal Permit and all Disposal Shipping Manifests and Tickets.

Daily site inspection logs, negative pressure logs and other OSHA compliance inspection records.

Air Monitoring Reports or Independent Monitoring Data conducted during the abatement.

Calibration Records[; G][; G, [_____]] for sampling equipment taken before and after each air sample.

Entry logs and Waste Drum Inventory maintained during the abatement task.

1.5 LICENSES PERMITS, AND NOTICES

The FLAC must possess a current license and comply with all Federal, State and Local Regulations. Only those consultants who are certified and licensed by DBPR are permitted to perform Asbestos Surveys or abatement specifications and plans as per Florida Statute 469.

The Contractor must possess a current Asbestos Contractor's License and secure all necessary licenses and permits associated with asbestos removal, transportation, and disposal as may be required by Federal, State, and local regulations. Only those Contractors who are certified and licensed by the State of Florida DBPR will be permitted to perform asbestos abatement activities at Kennedy Space Center.

A Waste Disposal Permit and all Disposal Shipping Manifests and Tickets are to be obtained.

Submit the following certificates:

Certification of participation in a Proficiency Analytical Test (PAT) program such as or equivalent to the American Industrial Hygiene Association PAT or Asbestos Analytical Registry (AAR) accreditation certificate, and Interlab QA/QC Program participation for the independent air monitoring agency selected by the Contractor before starting work.

Training Certification and accreditation certificates for the independent air monitoring agency's on-site personnel and a copy of independent air monitoring agency's Quality Control Program.

Certification documents by the Contractor verifying that employees have been provided current respirator fit test, training, and medical examinations in compliance with 29 CFR 1926.

Material safety data sheets as required for materials to be used on the specified project.

1.5.1 Notification

A written notice and any required fee's to obtain a Permit to demolish friable asbestos is to be sent to the State Asbestos Coordinator in accordance with FAC CHAPTER 62-257 by the Contractor. A copy of the notification is to be provided to the Government as part of the Implementation Plan.

1.6 IMPLEMENTATION PLAN

Prepare and submit a detailed, written Implementation Plan created, signed and sealed by a FLAC to the Government for approval, prior to the start of work, that includes the following:

Coordination drawings including site specific drawings of proposed work areas, clean room/change areas, mini-enclosures, shower, equipment room, waste loading/staging areas, locations of High Efficiency Particulate Air (HEPA) filtered negative pressure devices and exhaust points, work areas, emergency routing and areas to be modified.

Detailed drawings for asbestos abatement systems consisting of fabrication and assembly drawings for all parts of the work in sufficient detail to

enable the Government to check conformity with the requirements of the contract documents.

A copy of Notification of Demolition/Renovation.

Plan of Action, including proposed procedures to be used in complying with the requirements of this specification and 29 CFR 1926, sequence of asbestos abatement work, the interfaces of trades involved in the performance of work, posting of licenses, permits, etc., methods to be used to assure the safety of building occupants and visitors to the site, disposal plan including location of approved disposal site, a detailed description of the methods employed to control pollution and a detailed work schedule. Expand upon the method for removal of ACM, the use of portable HEPA ventilation systems, closing out of the buildings HVAC system, method of removal to prohibit visible emissions in the work area, and packaging of removed debris.

Details of the decontamination areas and procedures, locations of staging areas, posting of warning signs, and details of negative air system to be used in the work area.

Sketch(s) or drawing(s) of complete contract area(s) showing the shower room, clean room, drum staging area, decontamination and containment areas, the negative air system, and exits. Indicate designation of the "Competent Person", and Site Supervisor.

Provide a written Air Monitoring Plan to be prepared under the direction of and signed/stamped by a Certified Industrial Hygienist (C.I.H.)or FLAC specifying monitoring criteria and a resulting action plan for implementation by the Competent Person. The Plan must identify the Competent Person to be on site at all times (unless otherwise authorized by the Contracting Officer) during hazardous abatement operations. The FLAC or his/her representative/competent person is responsible for ensuring OSHA compliance during all phases of the abatement activities. Issue instructions which require this person, independently of production pressures, to stop non-conforming operations. Provide a qualified back-up person in the event that the Competent Person is absent from job site.

Provide certification that the Contractor, his staff and abatement workers (including supervisors) have attended and successfully completed asbestos abatement course(s) including refresher courses as set forth in FL-STAT 469 and in accordance with 29 CFR 1926, and 40 CFR 763.

Provide verification of a Respiratory Protection Program in accordance with 29 CFR 1910 including confirmation of worker training in the care, use, and maintenance of respirators and fit test certification.

Provide a written description of respiratory equipment and protective clothing provided the abatement workers.

Provide documentation that all personnel assigned to the abatement project have been examined annually by a physician. Submit the physician's written opinion containing the results of the medical examination in compliance with 29 CFR 1926 for each employee who will be employed on this project. Establish, maintain, and make readily available for review all Work site entry logs.

Procedures for enforcement of Personal Hygiene Practices.

Prepare and submit a Contingency Plan for emergencies including fire, accident, power failure, heating or cooling, negative air system failure, respirator supplied air system failure, or any other event that may require modification of the work area isolation procedures. Include in the plan specific procedures for decontamination or work area isolation, safe exiting and the need for medical attention in the event of an emergency.

Document all procedures and policies that are in effect to ensure that the worker safety and environmental plans are enforced.

Submit the Implementation Plan is to be submitted to the Government for review, revised by the Contractor where required, and resubmitted for approval. Commencement of work will not be permitted until the Implementation Plan is given final approval.

1.7 AIR MONITORING REPORTS

Obtain the services of an independent Air Monitoring Agency accredited by the American Industrial Hygiene Association (AIHA), for analysis of airborne asbestos concentration levels. Provide a copy of the monitoring agency's Quality Control Program to the contracting officer prior to commencement of the abatement activities. The individual performing the on-site air monitoring must meet the requirements as set forth in FL-STAT 469 and 40 CFR 763 and perform sample collections in accordance with the approved Air Monitoring Plan.

Air Monitoring must be done under the direction of the FLAC by an independent Air Monitoring Contractor and meet the Florida statute 469 requirements.

Calibrate pumps before and after each air sample and submit calibration records to the Government.

Submit Air Monitoring Reports daily logs (AMR) listing the airborne fiber concentration in fibers/cc. Include in AMR the following information for each sample:

Sample identification, Sample location,
Employee Name, Social Security Number,
Description of task being monitored,
Exposure level results in (f/cc),
Monitoring instrument identification number,
Pre-calibration, post calibration and average flow rate of each sample,
Sample date, start and stop times,
Type of protective devices worn (if any),
Project identification number, Facility number and name,
Sampling and Analytical Methods used,
Contact name and company, and name of individual performing the sampling.

Submit all Independent Monitoring Data.

1.7.1 Air Sample Analytical Method

Airborne fiber sampling and analytical procedures are to be by Phase Contrast Microscopy (PCM) in accordance with 29 CFR 1926 or the most current version of the NIOSH 94-113, Method 7400.

1.7.2 Air Sampling Rate, Volumes and Frequency

Conduct daily monitoring utilizing sample rates, volumes and frequency in accordance with 29 CFR 1926 and retain for final submittal at closeout. The minimum number of samples or sample volumes may not be less than those specified below:

Type of Sample	Volume	Minimum No. Samples	Location
Prior to set-up (within 24 hrs)	1200L	2	Regulated Area
Personal, During work	400L	2	Personal B.Z.
Area samples, Adjacent to work area.	1200L	2	Regulated Area
Area samples at Negative Air Unit Exhaust.	1200L	1	In area of outlets

1.8 WORKER PROTECTION

Perform Initial Exposure Assessments and Employee Exposure Monitoring in accordance with 29 CFR 1926.1101 with input and approval of the FLAC.

The Contractor's Competent Person must conduct an exposure assessment immediately before or at the initiation of the abatement work to ascertain expected exposures during the abatement work.

Select and provide respiratory protection to employees and ensure they are utilized in accordance with 29 CFR 1926.

Submit the Work schedule indicating the work days, hours, and the number of workers per shift. Include a bar chart to identify the individual milestones through to the completion of the project (i.e., number of days to complete work site preparation, number of days to complete ACM removal, number of days to complete final cleaning and lockdown, etc.).

Submit the OSHA compliance inspection records as part of the closeout documents.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TEMPORARY UTILITIES AND SERVICES

The Government will make available at the work site, water at hose bibs and 120 Volt AC at receptacles for the Contractor's use. Provide water proof safety lighting where necessary for safe, adequate illumination.

All electrical equipment to be used inside the work areas must be powered from an Underwriters Laboratory (UL) approved Ground Fault Circuit Interrupter (GFCI). Do not exceed the manufacturers limits per GFCI. Make all necessary connections and restore the site connections to their original condition or better prior to project completion.

Ensure all energized or pressurized systems inside the work area have been locked out, tagged out or otherwise rendered safe.

Provide temporary water from the existing building water source to control the generation of airborne dust, to allow for area, personnel, and equipment decontamination, and to supply decontamination unit needs. Also provide a backflow preventer at the source.

Provide temporary sanitary drainage piping to the decontamination unit sump and to the shower unit at a minimum slope of 2.0 percent, and temporary drainage piping to waste water pump and existing drain in accordance with local standards and as approved by the Contracting Officer.

3.2 WORK AREA PREPARATION

The Government will re-arrange equipment and storage areas to the extent of providing a direct and unobstructed path to the work area(s). During ACM removal, confine equipment and employees to the designated work area(s).

Unless otherwise directed by the Contracting Officer, the Contractor is to establish and maintain a [8 meters] [25-foot] [_____] access control barrier zone(s) around the designated work area(s). Interference with the functional operation of the building occupants outside these areas is not be permitted.

All building supply and return air ducts from the mechanical system must be isolated to eliminate air flow into or out of containment area(s).

Any work area considered for asbestos removal which shows visual debris is to be interpreted as possible asbestos contamination. The designated work area must be pre-cleaned.

3.2.1 Pre-Cleaning

Shut down HVAC systems and seal all critical barriers prior to initiating pre-cleaning actions. Openings, including but not limited to, windows, corridors, doorways, elevator openings, skylights, ducts, grilles, diffusers, and any other penetrations between the contaminated work areas and uncontaminated areas, must be sealed with plastic sheeting with a minimum thickness of 6 mil.

Pre-clean all movable objects identified as contaminated by the Contracting Officer or his representative within the work area using a HEPA filtered vacuum and wet cleaning methods as appropriate. Remove these objects after cleaning and store in a protected area.

Pre-clean all surfaces in the work area using HEPA filtered vacuums and/or wet cleaning methods as appropriate. Methods that would raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, are prohibited. Pay detailed attention to machinery or areas behind grilles and gratings.

Do not remove or otherwise disturb asbestos containing building materials during the pre-cleaning phase.

3.2.2 Work Area(s)

Inform all other Contractors on the site of the abatement work, of the nature of the Contractor's work with ACM and/or PACM, of the existence of

and requirements pertaining to regulated areas, and the measures taken to ensure that employees of such other Contractor employers are not exposed to asbestos in accordance with 29 CFR 1926.

Use industry controls and work practice methods in accordance with 29 CFR 1926. Daily site inspection logs must be posted at the jobsite by the on-site competent person and signed/approved by the FLAC or his/her designated representative.

Use flame resistant, 6 mil polyethylene when constructing Negative Pressure Enclosures (NPE) or decontamination areas.

3.3 WASTE LOAD-OUT UNIT

Establish a waste load-out unit to provide for interim secure storage. Include an equipment room for storage of asbestos-contaminated items (drums, tools, equipment). All equipment and waste containers must be decontaminated prior to being taken out of the work area(s).

All asbestos-containing waste material is to be sealed in leak-tight disposal containers. Thoroughly wet all waste within the disposal containers.

Maintain proper labeling protocols and keep a running and final inventory of all filled disposal containers.

3.4 SIGNS AND MARKINGS

Post signs prior to commencing asbestos work as required in 29 CFR 1926. Post signs near the perimeter of the asbestos work areas, along the route of the temporary waste material holding (Drum Staging) area, around the perimeter of the temporary holding area, and at all entrances to areas containing asbestos fibers. Signs must be conspicuous and legible.

Post telephone numbers and locations of emergency services including, but not limited to, fire, ambulance, doctor, and hospital, at a designated telephone located near the regulated area.

Post one copy of all permits at the work site perimeter in a accessible location outside the regulated area.

Post one copy of the Abatement Contractors current license at the work site perimeter in a accessible location outside the regulated area.

Hazard communication notification signs must be posted in accordance with KNPR 1840.19 requirements.

3.5 NEGATIVE AIR SYSTEM

Construct Negative Pressure Enclosures (NPE's) as required by 29 CFR 1926.

Duct each of the negative air units through the containment barrier walls to the outside of the work area(s). When the building is occupied, the ducts must exhaust into the outside air; otherwise, they may exhaust into an area of the building beyond the critical barriers. Never exhaust the units into the work area(s).

Provide each unit with temporary back-up electrical power (120 Volt AC) in the event of power failures or outages.

3.5.1 Testing

Design the negative air system to provide a minimum of four (4) air changes per hour and test before any work is begun. After the work area has been prepared, the decontamination unit set up, and the negative air units(s) installed, test the system. Prior to beginning abatement activities, a pre-work inspection and test will be conducted by the Contracting Officer or his representative to verify the adequacy of the containment system. Once activated, the negative air exhaust unit(s) must remain in operation until final clearance air monitoring has been performed and the Contracting Officer has approved their shutdown/removal. Maintain daily negative pressure logs for review by the FLAC and submit as part of the closeout documents.

Install a differential pressure meter or manometer to continuously measure pressure differential between inside and outside the work area for all Class I activities which utilize an NPE. Maintain a minimum pressure differential of 0.5 millimeter 0.02 inches of water.

3.6 RESPIRATORY PROTECTION

All personnel engaged in the asbestos removal work in the Work Area must at all times wear respirators in accordance with 29 CFR 1926. Instruct and train each worker involved in asbestos abatement in proper respirator use, and require that each worker in the work area always wear a respirator from the start of any operation which may cause airborne asbestos fibers until the Work Area is released for re-occupancy. All respirators must be fitted by approved qualitative or quantitative test. Use respiratory protection appropriate for the fiber level encountered in the Work Area and as specified herein, or as required for other situations encountered.

3.6.1 Air Quality for Supplied Air Respiratory Systems

The Contractor is to provide air used for breathing in Type "C" supplied air respiratory systems that meets or exceeds CGA G-7.1, standards for Grade D air.

3.7 REMOVAL OF ASBESTOS

Use industry controls and work practices for all operations in accordance with 29 CFR 1926 Methods of Compliance for Class I, II, III, or IV asbestos work. The FLAC or his/her representative are responsible for these practices.

All Class I and II work must be supervised by an on site Competent Person at all times that work is in progress. All class III and IV work must be supervised by a Competent Person.

Following removal of contaminated items and asbestos material, seal the edges of adjacent surfaces, which were exposed when asbestos was removed, with an asbestos bridging sealant/encapsulant.

3.8 DAILY HOUSEKEEPING

Maintain a clean work area in accordance with 29 CFR 1926. Perform the following housekeeping functions at the end of each shift or prior to leaving the work site unattended:

a. Prepare contaminated waste for disposal by packaging the waste and removing it from the work area.

b. HEPA vacuum the work area.

c. Visually inspect polyethylene in the work area and other high traffic areas.

3.9 CLEANING PROCEDURES

Clean the work area at the end of each day's abatement activities. Designate a separate, secured area within the work area for storage of debris until it can be properly disposed. Secure the work area after termination of the work day to prevent entry. Regularly dispose and replace disposable supplies, such as mop heads, sponges, and rags. Clean all equipment by HEPA vacuuming and wet wiping.

Clean all work areas in which abatement operations have been completed, starting at the ceiling and working down to the floors, by HEPA vacuuming and wet wiping. Prior to removal of worksite access controls and re-occupancy inspection by the Government, and upon satisfactory final clearance air sampling, and removal of polyethylene sheeting,, perform a final cleaning (wet wipe) of all surfaces within the work area.

3.10 INSPECTION

Do not commence removal of asbestos materials prior to satisfactory pre-work inspection of work site controls and containment barriers by the Abatement Contractor and a Government designated IH Representative.

3.10.1 Initial Inspection

The Contractor and the Government will conduct a walk-through of the work area prior to beginning the abatement work to review existing conditions and ensure safe and practical conditions for the work to be implemented. Any damage to structures, surfaces, and equipment, which could be misconstrued as damage resulting from work is to be documented by the Contractor and submitted to the Contracting Officer at least one day prior to start of work.

Take background samples for work areas in accordance with 29 CFR 1926 prior to beginning the abatement work.

3.10.2 Daily Inspection

Maintain an access log of all personnel who enter the regulated work area. Through continuous surveillance and inspections of the worksite the Contractor must ensure the integrity of containment, proper function of the negative pressure system, and posting of signs and labels. The Contractor must also ensure, through frequent inspections during each work shift, that negative pressure is maintained, appropriate work practices are followed, appropriate protective clothing and equipment are used, and worker decontamination procedures are being followed.

Ensure that critical barriers and negative pressure enclosures remain effectively sealed and taped. Take immediate action to remedy defects immediately upon discovery. Details of the inspections are to be included in the Contractor's daily inspection log and posted in an accessible location outside the regulated area.

Provide updated copies of the Air Monitoring Reports, Daily Site Inspection Logs and Waste Drum Inventory to the Government at the end of each week of the abatement work.

NASA/Kennedy Space Center reserves the right to conduct periodic inspections and air monitoring in the work area(s). If the work area is unsafe as determined by the contracting officer, NASA/Kennedy Space Center will require the Contractor to stop work until the unsafe conditions are corrected.

3.10.3 Final Inspection

The thoroughness of asbestos removal is to be evaluated by visually inspecting the affected surfaces for residual asbestos material and accumulated dust and by air sampling. Evidence of residual asbestos or asbestos debris on any adjacent surfaces upon completion of the work is not acceptable.

Upon completion of the work, a thorough visual inspection of the work area must be conducted by the Abatement Contractor and a Government designated IH Representative to ensure no residual asbestos material, dust or debris remains. Final inspections must be documented on KSC FORM 32-95 provided by the Government designated IH /Representative.

Final aggressive air sampling is to be performed by the Government for each NPE work area after completion of a satisfactory visual inspection. The clearance criteria is 0.01 fibers per cubic centimeter (f/cc) of air as determined by PCM. Satisfactory fiber counts from all final samples are to be less than 0.01 f/cc. If any of the final air samples contain greater than 0.01 f/cc the Contractor must repeat the final cleaning operation and the area re-tested until satisfactory clearance levels can be obtained.

Collect five (5) PCM final air samples for the first 5,000 square feet of containment plus one (1) additional PCM final air sample for each additional 5,000 square feet or one (1) air sample per room, whichever is greater. The number of final air samples may be reduced for small enclosures of less than approximately 2500 square feet. In no case may fewer than two (2) final samples be collected for any enclosure.

Clearance air sample volumes must meet the minimum volumes as indicated for analysis by NIOSH 94-113, Method 7400.

3.11 ASBESTOS WASTE AND CONTAMINATED MATERIALS

3.11.1 Removal of Asbestos Waste Materials

For purposes of this paragraph, asbestos waste materials are defined as those materials which contain or have been contaminated by asbestos and are not planned to be encapsulated and remain at the job site. They are primarily removed asbestos, disposable clothing and safety equipment, masking sheets, contaminated amended water, vacuum cleaner contents and filters.

Contain all asbestos waste material in two 6-mil polyethylene disposal bags, or two 6-mil disposal bags and a sealed leak-tight container such as, but not limited to, a steel or fiberboard drum. Pack the asbestos waste material while still wet. Clean the external surface of the waste containers by HEPA vacuuming and wet wiping before moving from the work

area. Protect the interior of truck or dumpster with two layers of polyethylene sheeting.

Label and clearly mark all disposal containers, dumpsters and trucks, including the inside bags in accordance with 40 CFR 61-SUBPART M, 29 CFR 1910 of OSHA's Hazard Communications Standard, and 49 CFR 171 and 49 CFR 172, Hazardous Substances.

The labels must be conspicuous, legible, and affixed to plastic bags and drums indicating the name of the waste generator and the location (facility name & number) where the waste was generated.

Also provide a Waste Shipment Record (WSR) to the waste site owner in accordance with the instructions in "Figure 4" of 40 CFR 61-SUBPART M.

3.11.2 Work Area Disposal

After final inspection has been completed and the work area is released for occupancy, shut off and remove the Negative Air System units. Unseal all entrances and exits. Dispose of all plastic sheeting, tape, and any other trash and debris, except for critical barriers, in sealable plastic bags, or in drums and moved to the staging area. After final wet wipe of the work area and satisfactory clearance air sampling, dismantle critical barriers and the decontamination unit.

3.11.3 Decontamination Area And Support Area Disposal

Dismantle the decontamination area after the work area is released by the Contracting Officer for re-occupancy. Vacuum all surfaces of the decontamination unit before it is disassembled.

3.12 WASTE TRANSPORTATION AND DISPOSAL

Transport and dispose of asbestos waste in full compliance with 40 CFR 61-SUBPART M, SUBPART A, 49 CFR 171 and 49 CFR 172.

3.13 ASBESTOS ABATEMENT NOTICE AND CHECKLIST

A Pre-Work Inspection form (KSC Form 32-96) and a Clearance Reoccupancy Inspection form (KSC Form 32-95) will be provided by the Government designated IH Representative. to the Contracting Officer upon satisfactory completion of the work. At least three days prior to the planned commencement of work, coordinate and schedule all Pre-Work and Clearance Site inspections with the Government designated IH Representative. The completed forms are to be used to establish approval of the containment, work practices and final acceptance/re-occupancy of the work area(s).

3.14 FINAL ACCEPTANCE

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NOTE: Section 01 77 00.00 20 CLOSEOUT PROCEDURES should be reviewed and revised to meet any required performance by the Contractor before the project is considered complete.
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The work will not be considered complete until the asbestos materials identified herein have been abated, the areas cleaned, satisfactory

clearance air monitoring completed, all asbestos contaminated waste has been properly disposed of, and all project close out documents have been received by the Contracting Officer.

-- End of Section --